

REMARKS

Claims 1-57 were presented for examination. By this Amendment, claim 34 has been canceled. Accordingly, claims 1-33 and 35-57 are presented for reconsideration.

AMENDMENTS TO THE DESCRIPTION

The changes to ¶¶ 0043 and 0046 merely correct terminology that was inconsistent with the rest of the description. The “melt channel 12” is actually the bore through the nozzle, while the “annular melt passage” is the space in the melt channel 12 defined between the nozzle and the valve pin through which melt flows. See, e.g., ¶¶ 0011 and 0012.

AMENDMENTS TO THE CLAIMS

Some phrases in independent claims 1 and 17 have been rearranged to improve syntax and clarity. Independent claim 33 has been amended by including the limitation of claim 34, viz., that the cross-section of the gate is wider than the cross-section of the melt channel. A similar limitation has been added to independent claim 51. Minor clarifying amendments have been made to some of the dependent claims.

THE CLAIMED INVENTION

The invention is directed to injection molding apparatus for forming articles having a hole. The apparatus has an injection nozzle with a melt channel, an annular gate through which molten material passes into the mold cavity, and a movable valve pin in the melt channel for controlling the flow of molten material through the annular gate.

Claims 1, 17, 33 and 51 are independent. Claim 1 specifies that the valve pin defines an “unrestricted” melt flow passage through the melt channel, and that the molten material can flow “unrestricted” to the gate. Claim 17 is virtually identical to claim 1, but specifies that the melt flow passage is “unobstructed” (instead of unrestricted), and that the molten material can flow “unobstructed” to the gate. Claim 33 recites that the valve pin has a stem portion and a head portion, the head portion blocking or opening the gate and having a wider cross-section than the stem portion. Claim 51 is directed to a system for molding a plurality of articles at once using a plurality of nozzles of the type recited in claim 33. All of the independent claims now recite that the cross-section of the gate is wider than the cross-section of the melt channel through the nozzle.

THE REJECTIONS

All of the claims (1-57) were rejected as unpatentable over prior art. Asai (US 5,460,763) is the basic reference applied in all of the rejections, as follows:

CLAIM(S)	STATUTORY BASIS	REFERENCE(S)
1-6, 11, 17-22, 27, 33-38, 43-49	35 U.S.C. §102(b)	Asai
7-10, 12-15, 23-26, 28-31, 39-42	35 U.S.C. §103(a)	Asai
16, 32, 50	35 U.S.C. §103(a)	Asai <i>ivo</i> Bauer (US 5,695,793)
51-55	35 U.S.C. §103(a)	Asai <i>ivo</i> Gellert (US 4,330,258)
56, 57	35 U.S.C. §103(a)	Asai <i>ivo</i> Gellert <i>ivo</i> Bauer

Applicant respectfully traverses the rejections for at least the following reasons.

Asai discloses a sprueless disc mold having a hot plunger that is actuated by a drive means to selectively open and close a mold gate. In an extended position, a head of the hot plunger mates with the mold gate to block the flow of melt into the mold cavity. In a retracted position melt is allowed to flow freely into the mold cavity. The mold cavity is sandwiched between a stationary molding member, which includes the hot plunger, and a movable molding member. The movable molding member includes an axially movable ejector sleeve, which is biased toward the head of the hot plunger. The ejector sleeve extends into the mold cavity when the hot plunger is retracted and is forced to retract due to the melt pressure when the hot plunger is extended. When the molded part in the mold cavity is cooled and the mold cavity is opened, the ejector sleeve projects to release the part from the cavity.

Contrary to the above-mentioned limitation common to claims 1, 17, 33 and 51, the cross-section of the mold gate of Asai is actually smaller than the cross-section of the melt channel. This is necessary in order to allow retraction of the hot plunger to open the mold gate. Asai, therefore does not teach or suggest a mold gate having a cross-section that is wider than the cross-section of the melt channel. Nor does any other reference of record.

Further, the forward face of the hot plunger of Asai constitutes one of the delimiting walls of the mold cavity. The forward face includes a chamfered corner that is necessary to produce the stack rib 80 of the molded part. This arrangement would not be possible if the hot plunger were to extend, as would be necessary if the mold gate cross-section was wider than the melt channel cross-section, to open the mold gate.

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Accordingly, claims 1, 17, 33 and 51 are not anticipated by the Asai reference; nor would the claims have been obvious over the Asai reference taken alone or in combination with other references of record. It follows that dependent claims 2-16, 18-32, 35-50 and 52-57 are also not anticipated by or obvious over Asai.

For the foregoing reasons, the rejections should be withdrawn and all of the claims allowed. Favorable action is earnestly solicited.

Respectfully submitted,

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